

RD-R142 738

AFRICAN DOPPLER SURVEYS (ADOS) (U) DEFENSE MAPPING
AGENCY HYDROGRAPHIC/ TOPOGRAPHIC CENTER WASHINGTON DC
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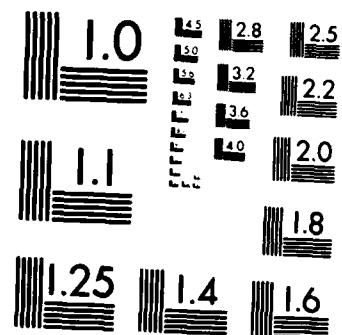
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MICROCOPY RESOLUTION TEST CHART
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AD-A142 738

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SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1. REPORT SECURITY CLASSIFICATION		2. SECURITY CLASSIFICATION AUTHORITY			
UNCLASSIFIED		Approved for public release; distribution unlimited.			
3a. SECURITY CLASSIFICATION AUTHORITY		Approved for public release; distribution unlimited.			
N/A		N/A			
3b. DECLASSIFICATION/DETERMINATION SOURCE		N/A			
N/A		N/A			
4. PERFORMING ORGANIZATION SECURITY NUMBER		N/A			
N/A		N/A			
NAME OF PERFORMING ORGANIZATION		5. OFFICE SYMBOL <i>(If applicable)</i>		6. SUBJECT KEY WORDS	
Defense Mapping Agency Hydrographic/Topographic Ctr		DMAHTC/GST		N/A	
ADDRESS (City, State and ZIP Code)		7. APPROVAL NUMBER			
6500 Brookes Lane Washington, DC 20315		N/A			
NAME OF FUNDING/SPONSORING ORGANIZATION		8. OFFICE SYMBOL <i>(If applicable)</i>		9. SUBJECT KEY WORDS	
Defense Mapping Agency		PAO		N/A	
ADDRESS (City, State and ZIP Code)		10. SOURCE OF INFORMATION			
Building 56, US Naval Observatory Washington, DC 20315		N/A			
TITLE <i>(Include Security Classification)</i>		11. APPROVAL NUMBER		12. APPROVAL NUMBER	
Status Report on African Doppler Surveys (ADOS)		N/A		N/A	
12. PERSONAL AUTHORITY		13. DATE OF REPORT (Year, Month, Day)			
Kumar, Muneendra		1984 June			
13a. TYPE OF REPORT		13b. TIME COVERED		13c. PAGE COUNT	
Final		FROM _____ TO _____		8	
16. SUPPLEMENTARY NOTATION					
Status report prepared for presentation at the International Symposium on Space Techniques for Geodynamics, 9-13 July in Sopron, Hungary					
17. COSATI CODES		18. SUBJECT TERMS (Continuation of reverse of previous page if necessary)			
FIELD	GROUP	SUB-GR.	ADOS (African Doppler Surveys) Precise Ephemeris		
08	05				
19. ABSTRACT <i>(Continue on reverse if necessary and identify by block number)</i>					
<p>► This report outlines the work performed between 15 June 1983 and 30 April 1984 by the Defense Mapping Agency (DMA) under the African Doppler Survey (ADOS) project. The observational data and Precise Ephemeris (PE) for 59 ADOS stations in 13 countries were distributed to the ADOS Computing Centers in the United Kingdom, Kenya and Algeria. Results of computations performed at DMA are also included.</p>					
 					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT			21. ABSTRACT SECURITY CLASSIFICATION		
UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS <input type="checkbox"/>			UNCLASSIFIED		
22a. NAME OF RESPONSIBLE INDIVIDUAL			22b. TELEPHONE NUMBER		22c. OFFICE SYMBOL
KUMAR, MUNEENDRA			(202) 227-2262		DMAHTC/GSGA

STATUS REPORT
ON
AFRICAN DOPPLER SURVEYS
(ADOS)

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Accession For	<input checked="" type="checkbox"/>
NTIS GRA&I	<input type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unlimited need	<input type="checkbox"/>
Justification	<input type="checkbox"/>
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Distribution/	<input type="checkbox"/>
Availability Codes	<input type="checkbox"/>
AVAIL and/or	<input type="checkbox"/>
RESTRICTED	<input type="checkbox"/>
Special	<input type="checkbox"/>

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ABSTRACT

This report outlines the work performed between 15 June 1983 and 30 April 1984 by the Defense Mapping Agency (DMA) under the African Doppler Survey (ADOS) project. The observational data and the Precise Ephemerides (PE) for 59 ADOS stations in 13 countries were distributed to the ADOS Computing Centers in United Kingdom, Kenya and Algeria. Results of computations performed at DMA are also included in the report.

1. INTRODUCTION

This report summarizes the work performed by the Defense Mapping Agency (DMA) under the African Doppler Survey (ADOS) project since the last report at the XVIII General Assembly of the International Union of Geodesy and Geophysics (IUGG) at Hamburg, Federal Republic of Germany, August 1983 (Kumar, 1983). The project progress described covers the period between 15 June 1983 and 30 April 1984.

The observational data sets, together with the appropriate Precise Ephemerides (PE) distributed since 15 June 1983, pertained to 13 countries under the ADOS project. The Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC) ADOS Computing Center also computed the station coordinates from the selected data sets.

2. DATA DISTRIBUTION

2.1 OBSERVATIONAL DATA

Table 1 gives the details of the Doppler data exchanged between the DMAHTC Computing Center (ADOS Center No. 3) and the other ADOS Computing Centers, No. 1 - European Consortium, United Kingdom, No. 2 - Regional Computing Center, Kenya and No. 4 - Northwest African Consortium, Algeria. In addition, data tapes containing the observed data and PE (already distributed to Computing Centers No. 1 and 2 prior to 15 June 1983) were sent to Computing Center No. 4.

0 2657

84 07 05 092

The data sets in Table 1 also include additional observations from the West German data for two stations, AIV010 and AIV011, which are identical to stations AIV003 and AIV001 (distributed prior to 15 June 1983), respectively.

2.2 PRECISE EPHEMERIS

Together with the observational data for the ADOS stations (Section 2.1), the DMAHTC Computing Center also provided the PE needed for computations. The PE information for five satellites of the Navy Navigation Satellite System (NNSS) was supplied as per availability.

3. ADOS COMPUTATIONS

Table 2 presents the status of the 59 ADOS stations computed at DMA between 15 June 1983 and 30 April 1984. The ADOS requirement of 40 or more passes could not be met at nine selected stations.

ADOS station coordinates, as computed by the DMAHTC Computing Center are tabulated in Table 3. The table also includes the available information regarding the height of the electrical center of the antenna and the number of Doppler passes input and actually used in each station solution.

4. PRELIMINARY EVALUATION

Table 1 also includes the status report of the observations for the ADOS network as evaluated by the DMAHTC Computing Center.

Out of 149 observed Doppler passes for the ADOS station (ADM301) in Benin, 71 passes were rejected during computations for various reasons. The solution from 78 passes failed to converge within the specified limits and as such the coordinates in Table 3 are provisional pending final acceptance under the ADOS project.

5. ACKNOWLEDGEMENT

This is to acknowledge the valuable contributions of Messrs. Randall Keener, Kenneth Murphy, Joseph Corio and Bernard Staley.

REFERENCES

KUMAR, M., "Status Report on African Doppler Surveys (ADOS)," presented to the XVIII General Assembly of the IUGG, Hamburg, FDR, 15 - 27 August 1983.

TABLE 1

ADOS DATA EXCHANGE
(FROM 15 JUNE 1983 TO 30 APRIL 1984)

COUNTRY	NO. OF ADOS STATIONS DISTRIBUTED BY DMAHTC	STATUS OF ADOS NETWORK
Benin	1	Not yet complete
Cameroon	7	Complete
Canary Island	1	Not yet complete
Equatorial Guinea	3	Not yet complete
Gambia, The	2	Complete
Ivory Coast	5*	Complete
Morocco	14	Complete
Seychelles	5	Complete
South Africa	3	Not yet complete
Sudan	1	Not yet complete
Tanzania	-	Complete
Tunisia	5	Complete
Cambodia	5	Complete

*Additional data for two stations already selected prior to 15 June 1983 (Section 3.1).

TABLE 2

DMAHTC COMPUTING CENTER NO. 3

COMPUTATIONAL PROGRESS

(FROM 15 JUNE 1983 TO 30 APRIL 1984)

COUNTRY	NO. OF ADOS STATIONS COMPUTED	40 OR MORE PASSES	25 TO 39 PASSES
BENIN	1	1	--
CAMEROON	7	5	2
CANARY ISLAND	1	1	--
EQUATORIAL GUINEA	3	1	2
GAMBIA, THE	2	1	1
IVORY COAST	5*	5	--
MOROCCO	14	11	3
SEYCHELLES	5	4	1
SOUTH AFRICA	3	3	--
SUDAN	1	1	--
TANZANIA	7	7	--
TUNISIA	5	5	--
ZAMBIA	5	5	--
 TOTAL	59	50	9

*Additional data for two stations already selected prior to
15 June 1983 (Section 2.1).

TABLE 3
ADOS STATION COORDINATES

(NSWC 92-1 SYSTEM)

COUNTRY	COMPUTED COORDINATES OF STATION MARK (SOFTWARE DOPPLR '79)				HEIGHT OF ANTENNA E.C. ABOVE STATION MARK (m)	NO. OF PASSES FOR SOLUTION INPUT USED
	X (m)	Y (m)	Z (m)			
	LATITUDE (ϕ)	LONGITUDE (λ)	ELLIPSOID HT. (m)			
1. <u>BENIN</u>						
ADM301	6 333 473.28 N 06° 21' 46"373	E 268 522.29 2° 25' 39"341	702 160.62 47.56	--		149/78
2. <u>CAMEROON</u>						
ACM001	6 236 367.76 N 03° 50' 28"453	E 1 271 551.61 11° 31' 27"277	424 482.15 767.57	1.608		83/59
ACM002	6 177 935.28 N 04° 35' 30"672	E 1 504 634.33 13° 41' 16"383	507 266.21 715.55	1.335		73/51
ACM003	6 273 190.52 N 04° 37' 14"227	E 1 036 078.59 9° 22' 41"863	510 429.72 622.32	1.673		36/32
ACM004	6 228 224.35 N 06° 31' 01"340	E 1 182 197.96 10° 44' 51"453	719 350.11 2 240.69	1.945		49/40
ACM005	6 150 819.34 N 07° 18' 11"181	E 1 486 511.88 13° 35' 11"592	805 543.01 1 162.82	1.862		41/35
ACM006	6 123 024.35 N 09° 21' 48.231	E 1 457 007.57 13° 23' 05"722	1 030 885.04 270.50	1.523		43/42
ACM007	6 029 726.33 N 12° 05' 37"316	E 1 597 702.08 14° 50' 26"411	1 327 605.53 308.28	1.623		45/41
3. <u>CANARY IS.</u>						
ASP002	5 390 988.57 N 28° 06' 34"359	E -1 623 441.24 343° 14' 27"099	2 987 279.81 122.97	--		123/79
4. <u>EOQUATORIAL GUINEA</u>						
AEK301	6 181 849.53 N 01° 53' 26"629	E 1 084 106.23 9° 47' 29"468	209 029.64 13.64	--		75/44
AEK317	6 249 867.82 N 02° 09' 20"126	E 1 253 145.21 11° 20' 16"395	238 320.65 600.97	--		61/30
AEK344	6 261 171.04 N 01° 17' 45"955	E 1 211 075.98 10° 56' 50"378	143 319.14 698.67	--		42/36

TABLE 5 (CON.)
ADOS STATION COORDINATES
(NSWC 92-1 SYSTEM)

COUNTRY	COMPUTED COORDINATES OF STATION MARK (SOFTWARE DOPPLR '9) (ELLIPSOID USED: $a=6378145\text{m}$, $f=1/298.25$)			HEIGHT OF ANTENNA E.C. ABOVE STATION MARK (m)	NO. OF PASSES FOR SOLUTION INPUT/USED
	X (m)	Y (m)	Z (m)		
	LATITUDE (ϕ)	LONGITUDE (λ)	ELLIPSOID HT. (m)		
5. <u>GAMBIA, THE</u>					
AGA002	5 966 626.37 N $13^{\circ} 34' 15''$ 033	-1 689 702.09 E $344^{\circ} 11' 17''$ 849	1 486 883.52 55.84	0.56	57/50
AGA003	6 001 236.86 N $13^{\circ} 28' 08''$ 948	-1 572 660.45 E $345^{\circ} 18' 55''$ 783	1 475 939.90 35.38	0.56	36/33
6. <u>IVORY COAST</u>					
AIV010	6 297 287.52 N $07^{\circ} 42' 04''$ 830	-551 191.84 E $354^{\circ} 59' 51''$ 855	849 110.30 372.84	1.8	389/336
AIV011	6 306 985.96 N $04^{\circ} 25' 13''$ 980	-814 426.51 E $352^{\circ} 38' 31''$ 430	488 328.81 54.95	1.4	198/157
AIV012	6 224 392.84 N $10^{\circ} 13' 35''$ 967	-818 117.06 E $352^{\circ} 30' 43''$ 643	1 125 011.61 456.91	0.9	90/82
AIV013	6 268 488.84 N $06^{\circ} 35' 17''$ 682	-926 897.08 E $351^{\circ} 35' 19''$ 838	726 958.42 343.90	1.9	135/121
AIV014	6 304 023.43 N $05^{\circ} 47' 29''$ 104	-728 760.04 E $353^{\circ} 24' 20''$ 675	639 334.75 201.68	1.8	127/118
7. <u>MOROCCO</u>					
AM0001	5 156 641.65 N $35^{\circ} 45' 29''$ 297	-513 568.17 E $354^{\circ} 18' 44''$ 877	3 706 753.42 516.44	0.48	122/102
AM0002	5 216 787.57 N $35^{\circ} 08' 29''$ 952	-221 228.69 E $357^{\circ} 34' 18''$ 151	3 650 784.14 88.76	2.194	42/36
AM0003	5 258 006.44 N $33^{\circ} 59' 12''$ 986	-618 468.61 E $353^{\circ} 17' 29''$ 245	3 545 370.30 216.99	3.57	116/101
AM0004	5 343 508.15 N $33^{\circ} 09' 18''$ 400	-171 623.35 E $358^{\circ} 09' 37''$ 442	3 469 142.03 1 398.39	3.02	117/110
AM0005	5 353 362.42 N $32^{\circ} 43' 12''$ 160	-455 857.09 E $355^{\circ} 07' 58''$ 117	3 428 787.48 1 674.19	1.635	44/42
AM0006	5 379 700.47 N $31^{\circ} 38' 16''$ 216	-777 590.93 E $351^{\circ} 46' 31''$ 201	3 326 539.85 433.78	1.824	60/55
AM0007	5 430 382.49 N $31^{\circ} 06' 17''$ 219	-633 760.84 E $353^{\circ} 20' 35''$ 967	3 276 594.09 1 440.93	4.01	102/89
AM0008	5 436 696.45 N $30^{\circ} 15' 34''$ 309	-919 644.10 E $350^{\circ} 23' 56''$ 469	3 195 322.61 123.68	1.658	52/51
AM0009	5 509 918.36 N $28^{\circ} 22' 13''$ 050	-1 089 332.36 E $348^{\circ} 48' 59''$ 832	3 012 800.42 254.37	1.630	49/36

ADCS STATION COORDINATES

(NSWC 92-2 SYSTEM)

COUNTRY	COMPUTED COORDINATES OF STATION MARK (SOFTWARE DOPPLR '9)				HEIGHT OF ANTENNA E.C. ABOVE STATION MARK (m)	NO. OF PASSES FOR SOLUTION INPUT/USED
	X (m)	Y (m)	Z (m)			
	LATITUDE (ϕ)	LONGITUDE (λ)	ELLIPSOID HT. (m)			
7. MOROCCO						
AM0010	5 238 066.20 N 34° 27' 58"396	-525 190.70 E 354° 16' 27"903	3 589 315.48 191.31	1.873	59/51	
AM0011	5 269 802.02 N 34° 13' 41"829	-319 967.06 E 356° 31' 31"557	3 567 717.39 536.60	2.97	127/119	
AM0012	5 275 417.74 N 33° 37' 53"600	-657 951.23 E 352° 53' 26"765	3 512 683.11 336.85	2.089	48/45	
AM0013	5 484 067.90 N 29° 21' 11"108	-943 984.84 E 350° 13' 59"737	3 108 610.80 1 093.70	1.156	45/43	
AM0014	5 303 920.24 N 32° 53' 03"676	-784 546.36 E 351° 35' 09"324	3 443 311.97 207.90	2.135	52/31	
8. SEYCHELLES						
ASE001	3 599 452.14 S 04° 40' 12"040	5 239 878.11 E 55° 30' 48"568	-515 820.40 -38.52	--	51/47	
ASE002	3 597 924.21 S 04° 46' 40"213	5 239 735.84 E 55° 31' 26"824	-527 703.37 -38.86	1.830	63/58	
ASE003	3 761 867.20 S 05° 42' 09"526	5 111 710.45 E 53° 38' 58"159	-629 542.93 -39.96	1.950	42/39	
ASE004	3 513 180.16 S 07° 07' 03"595	5 264 738.74 E 56° 17' 04"802	-785 045.52 -29.37	1.970	48/42	
ASE005	3 580 686.40 S 04° 18' 33"595	5 256 600.66 E 55° 44' 17"260	-476 065.17 46.84	1.600	54/51	
9. SOUTH AFRICA						
ASF002	5 360 994.28 S 28° 45' 28"985	1 605 019.55 E 16° 40' 01"526	-3 050 590.53 347.50	0.510	45/43	
ASF004	4 786 108.14 S 27° 41' 43"277	3 006 381.65 E 32° 08' 05"566	-2 946 925.04 573.78	0.510	44/45	
ASF005	5 022 040.91 S 33° 22' 54"789	1 795 031.15 E 19° 40' 06"401	-3 490 661.97 2 281.64	0.710	45/42	
10. SUDAN						
ASU004	5 729 264.52 N 09° 46' 29"718	2 588 052.47 E 24° 18' 35"595	1 075 816.57 543.62	0.595	78/71	

ADOS STATION COORDINATES

(NSWC 9Z-1 SYSTEM)

COUNTRY	COMPUTED COORDINATES OF STATION MARK (SOFTWARE DOPPLR '93)				HEIGHT OF ANTENNA E.C. ABOVE STATION MARK (m)	NO. OF PASSES FOR SOLUTION INPUT/USED
	X (m)	Y (m)	Z (m)			
	LATITUDE (ϕ)	LONGITUDE (λ)	ELLIPSOID HT. (m)			
11. <u>TANZANIA</u>						
	ATZ200	5 137 322.68 S 06° 03' 41"050	3 721 881.00 E 35° 55' 21"109	-669 131.47 1 136.81	1.920	75/73
	ATZ201	5 092 391.26 S 03° 16' 32"896	3 826 183.33 E 36° 55' 10"121	-362 131.64 1 835.45	1.300	75/53
	ATZ203	5 345 090.27 S 05° 06' 32"112	3 436 056.26 E 32° 44' 04"816	-564 296.30 1 278.85	1.590	75/60
	ATZ204	5 445 082.07 S 01° 08' 01"850	3 321 558.29 E 31° 23' 01"095	-125 392.44 1 314.02	1.450	75/63
	ATZ205	5 524 703.94 S 04° 51' 58"810	3 143 098.42 E 29° 38' 10"633	-537 535.42 907.66	1.650	75/60
	ATZ206	5 403 629.92 S 07° 56' 56"331	3 275 697.50 E 31° 13' 27"753	-876 431.22 1 723.15	1.450	75/67
	ATZ207	5 077 799.23 S 10° 32' 55"217	3 681 651.75 E 35° 56' 38"187	-1 160 149.72 1 010.26	1.470	67/65
12. <u>TUNISIA</u>						
	ATS301	5 022 224.52 N 36° 49' 26"390	955 277.19 E 10° 46' 10"481	3 802 183.58 672.75	--	75/45
	ATS302	5 081 417.83 N 36° 24' 39"650	771 778.81 E 8° 38' 10"414	3 765 459.31 779.77	--	73/42
	ATS303	5 147 810.76 N 35° 20' 01"689	803 893.45 E 8° 52' 32"694	3 668 923.00 1 345.54	--	53.42
	ATS304	5 220 571.57 N 34° 15' 29"015	772 110.44 E 8° 24' 46"534	3 570 251.17 187.13	--	74.52
	ATS305	5 233 998.08 N 33° 42' 15"719	904 982.93 E 9° 48' 34"993	3 519 303.27 153.96	--	73.48
13. <u>ZAMBIA</u>						
	AZA401	5 612 258.72 S 14° 47' 46"891	2 561 366.53 E 24° 31' 52"963	-1 618 625.49 1 169.17	0.590	75 71
	AZA402	5 504 577.30 S 16° 52' 22"079	2 643 345.43 E 25° 39' 02"590	-1 839 591.60 1 111.83	1.390	75 72
	AZA403	5 594 487.10 S 13° 07' 12"515	2 705 134.38 E 25° 48' 19"533	-1 438 594.12 1 446.30	0.760	75 71
	AZA404	5 307 824.79 S 14° 17' 53"088	3 161 736.65 E 30° 46' 52"265	-1 583 050.34 1 325.03	0.790	75 50
	AZA405	5 245 642.15 S 10° 07' 25"110	3 455 103.43 E 33° 22' 16"913	-1 114 034.38 1 618.71	0.420	73 50

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